

Belimo P1013 US
Application SN 10/596,263
Applicant Frank LEHNERT

(3) Remarks

Reconsideration of claims 1-16 and allowance of these claims in amended form and allowance of new claims 20-25, are respectfully requested in light of the above amendments and the following remarks.

Claims 17-19 have been canceled.

Claims 20-25 have been added.

Claim 19 was held to be nonelected in the final office action, and has now been canceled.

The amendments to the specification describe what is shown in the figures. No new matter is added.

The amendments to the claims are supported generally by the figures and the related description. No new matter is added.

Support of the various amendments in claim 1 can be found in the original description, including the drawings, as follows:

The amendment to part (b) is supported at page 6, lines 16-17 ("The drive axle 28 and an air flap 32 are rigidly connected to one another") and Fig. 1.

The amendment to part (f) is supported by Fig. 1 and the related disclosure, particularly page 6, line 30.

The amendment to part (g) is supported by Fig. 1 and the related disclosure, especially page 6, lines 6-8 and by new paragraph 0056.

The amendment to part (h) is supported by page 2 lines 4-6, page 4, lines 11-12 and the drawings showing differing cross sections.

Support of the various amendments in claim 2 can be found in the original description, including the drawings, as follows:

Fig. 1 and the related disclosure, especially page 3, lines 2-4.

Support for new claim 20 can be found in the original description, including the drawings, as follows:

Fig. 8 and the related disclosure.

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Support for new claim 21 can be found in the original description, including the drawings, as follows:

Fig. 1, 2, 7-15 and the related disclosure.

Support for new claim 22 can be found in the original description, including the drawings, as follows:

Fig. 1, 2, 7-15, and the related disclosure, especially at Page 7 lines 7+.

Support for new claim 23 can be found in the original description, including the drawings, as follows:

Fig. 1, 2, 7-15, and the related disclosure especially at Page 8, lines 21+.

Support for new claims 24 can be found in the original description, including the drawings, as follows:

Fig. 1, 2, 7-15, and the related disclosure especially at Page 8, lines 21+ and Fig. 1 and the related disclosure, especially page 3, lines 2-4.

Claim Rejections – 35 USC §103

Claims 1-18 were rejected under 35 USC §103(a) as defining an invention that is obvious from McCabe in view of Stone. This rejection is respectfully traversed.

It will be recalled that the invention relates to a device for controlling the air flow in a ventilating pipe with one or more air flaps which can be actuated synchronously and which prevent the air flow in the pipe in the closed position. Central to and a distinguishing feature of the invention is the "*diagonal orientation*" of the fastening web *inside* of the ventilating pipe. This orientation makes it possible, that the same fastening web can be used for different pipe dimensions by just attaching appropriate air flaps. The essential structural elements required for this flexibility are:

S1. The "fastening web" (housing containing the actuator and the gearing means) must be attached to the inner wall of the ventilating pipe by a "fastening web holder"

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(mechanical attachment) with a joint ("fastening axle 14") that allows a rotation of the "fastening web" within a vertical plane of symmetry of the ventilating pipe.

S2. The fastening axle (14) must be separated by a certain distance from the drive axle (26) such that the distance of the drive axle from the pipe wall is variable depending on the inclination of the fastening web relative to the pipe wall. (The distance of the drive axle to the fastening axle defines the maximum diameter of the pipe that can be served by the same fastening web.)

S3. The fastening axle and the drive axle must be parallel to each other so that the change in the inclination of the fastening web (which depends on the diameter of the ventilating pipe) does not change the geometry of the drive axle within the ventilating pipe.

S4. The air flaps are rigidly connected to the drive axle. The drive axle has a fixed geometrical orientation of its longitudinal axis relative to the fastening web.

In most practical cases the following feature is also important:

S5. The gearing means and the actuator are mounted on the fastening web (i.e. in the housing of the fastening web).

The mechanical features S2 und S3 are clearly shown in the drawings and the description explains important structural features and some interrelationships of the elements.

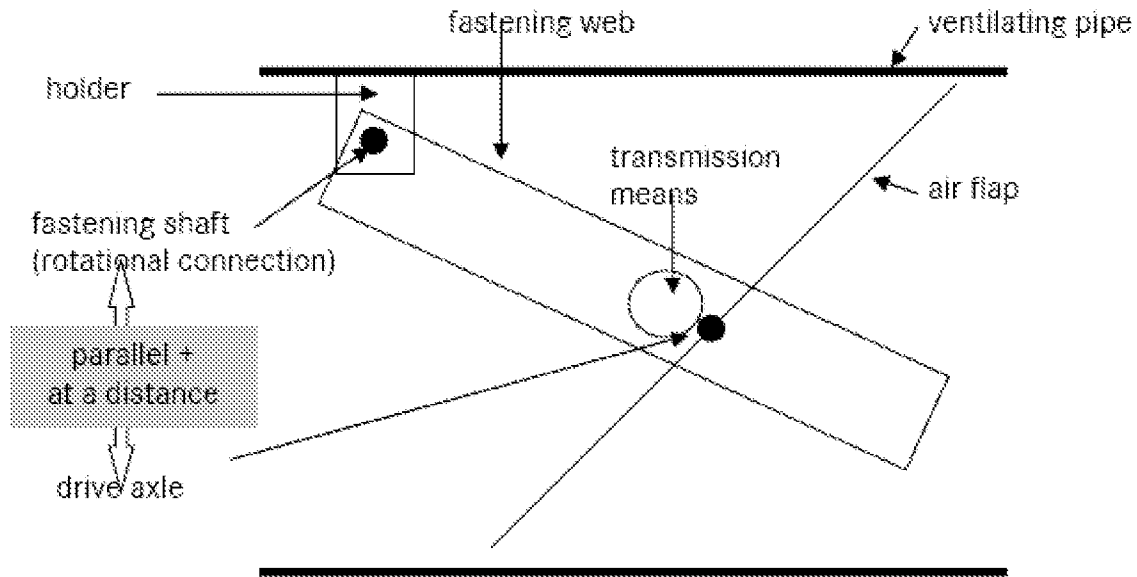


Fig. A1

Importantly, none of the prior art cited shows anything that is close to this concept. The currently proposed claim language has been adopted to better define these structural features in a way that more demonstrably distinguishes from the cited art.

The language of the claims has been carefully reviewed to clearly define structural distinctions over the prior art and are believed by their terms to provide clarity. To assure that the examiner understands them the way that key terms are intended by the applicant, we provide the following comments:

- I. The phrase "rotational about said drive axle" (claim element b) is meant to mean that the drive axle is the center of the rotational movement of the air flap.
- II. The phrase "rigidly connected to the drive axle" (claim element b) is meant to mean that there is a direct and inflexible connection. The connection does not include any transmission gear (i.e. gear wheel, articulation, linkage) or the like between the drive axle and the air flap.

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III. The phrase "fastening web" is meant to mean a stiff, elongate mechanical element that is able to carry and fasten the air flaps within the ventilating pipe.

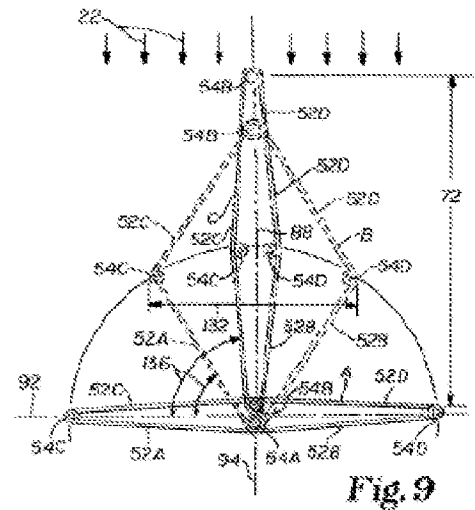
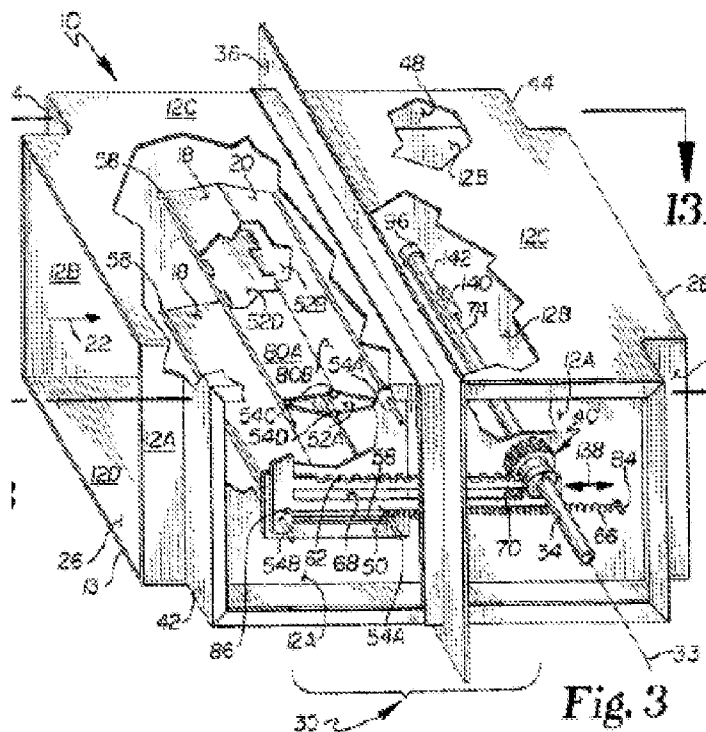
IV. The phrase "mounted on" is meant to mean that the gearing means for transmitting force (i.e. the gear) is supported by and fixed to the fastening web. In particular, the gearing means are inside the housing of the fastening web.

With this as background and explanation, applicant acknowledges that the final rejection, though citing references said to teach certain aspects of the invention, recognizes that the invention according to claim 1 as previously presented was new. Current claim 1 has sharpened the distinctions and clarified the important structural features that make the invention not only novel but unobvious also.

US 2001/0027814 (Stone, *et al.*) describes an air flap system, which is based on four hinged panels (52A – 52D) joined to form a hinged parallelogram that can act as a closure 18 of the ventilating pipe (par. 0110). The two rear plates (52C, 52D) are connected with each other by driven hinge pin 54B which are displaceable transversely to the hinge pin axis (par. 0112). A stationary hinge pin 54A connects the two front plates 52A, 52B with each other (Abs. 0111). By linearly shifting the driven hinge pin (54B) relative to the stationary hinge pin (54A) the closure opens and closes (par. 0112). The movable hinge pin (54B) is driven in a longitudinal direction (138) of the ventilating pipe by means of a slide assembly 50, which is arranged outside of the ventilating pipe. The slide assembly comprises a gear 40 (par. 0127).

Figure 3 of Stone, *et al.*, is shown below.

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In contrast to the invention there is no fastening web (beam, carrier), that can be mounted in a variable angle in the ventilating pipe in order to fit into different dimensions of the pipes. In addition, the one or more air flaps are not rigidly connected to a drive axle and are not rotational about said drive axle. There is no rotatable connection between a fastening web holder and a fastening web.

It is important to note that by reference numerals "52A, 52B", Stone, *et al.*, do not refer to a fastening web but to plates that constitute the air flaps. The assertion in the final office action that, *et al.*, show a dependency between the angle of inclination of the fastening web and the ventilating pipe diameter is clearly unsupported by the reference itself.

In summary, the following differences between claim 1 and the McCabe are to be noted:

<u>Claim element</u>	<u>Stone, <i>et al.</i></u>
b) ...wherein each of the one or more air flaps is <u>rigidly</u> connected to a drive axle <u>and is</u>	No. "panel 52C, 52D" flexibly connected to

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- | | | |
|----|---|---|
| | rotational about said drive axle,... | "driven hinge pin 54B" [0126] |
| c) | ...a fastening web with a pivot bearing for said drive axle of the one or more air flaps,... | No: "stationary hinge pin 54A" is fixed to the pipe and is not connected to "driven hinge pin 54B" |
| e) | ...wherein said gearing means for transmitting force and/or torque are mounted on the fastening web, ... | No: "drivetrain 30" is in a "control compartment 42, 44" outwardly from the wall 12A" [0105] |
| f) | <u>...a fastening web holder fixing the fastening web to the inside of the ventilating pipe</u>
wherein said fastening web and said means for transmitting force <u>and/or torque</u> are arranged in the ventilating pipe, on a longitudinally extending plane of symmetry, ... | No: "drivetrain 30" is in the control compartment outwardly of the pipe [0105];
"stationary hinge pin 54A" is directly fixed to the pipe wall |
| g) | <u>...a rotatable connection between said fastening web holder and the fastening web,</u>
<u>wherein said rotatable connection is at a distance from said drive axle...</u> | No: The "stationary hinge pin 54A" is mounted in a hole in the "pipe wall 12A" without a rotational connection |

Prior to discussing non-obviousness the Applicant points out the following differences between claim 1 and Fig. 9 of McCabe:

- | | <u>Claim element</u> | <u>McCabe</u> |
|----|---|--|
| b) | ...wherein each of the one or more air flaps is rigidly connected to a drive axle <u>and is rotational about said drive axle,...</u> | No: Drive axle is rotatable with respect to air flaps. |
| e) | ...wherein said gearing means for transmitting force and/or torque are mounted on the | No: fastening web (in Fig. A) is linearly displaceable with respect to motor. |

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fastening web, ...

- | | |
|--|---|
| <p>f) ...a <u>fastening web holder fixing the fastening web to the inside of the ventilating pipe</u> wherein said fastening web and said means for transmitting force <u>and/or torque</u> are arranged in the ventilating pipe, on a longitudinally extending plane of symmetry, ...</p> | <p>No: fastening web (in Fig. A) is carried by the "pivot bearing" (Fig. A) which is movable (and not fixed) with respect to ventilating pipe.</p> |
| <p>g) ...a <u>rotatable connection between said fastening web holder and the fastening web</u></p> | <p>No: no additional fastening shaft (fastening shaft \neq drive axle))</p> |

In contrast to the arguments of the examiner, the invention is not an obvious combination of McCabe and Stone, *et al.* The following points are significant.

Applicant first notes that the two mechanical solutions of McCabe and Stone, *et al.*, are completely different. They apply different technical principles and use different technical constructions. McCabe (Fig. 9) uses a threaded pin arranged on the longitudinal axis in the center of the ventilating pipe in order to move a crossbar (which is oriented orthogonal to the longitudinal axis of the ventilating pipe). The outer ends of the crossbar are connected by linkage arms which are flexibly connected to the air flaps to open them. On the other hand, Stone, *et al.*, proposes a closure that is made of four plates forming a parallelogram flap and that is actuated by a linear movement of one of the four joint pins, while the actuator mechanism must be arranged outside of the ventilating pipe.

Also, it is important to note that applying the teaching of Stone, *et al.*, to modify McCabe leads to a solution where the motor and the threaded drive pin are replaced by the linear drive mechanism of Stone, *et al.*, which is arranged outside of the pipe instead of inside. Such a solution does however not show a rotatable connection between the fastening web and the pipe wall. In addition, such a combination does not have gear means mounted on the fastening web.

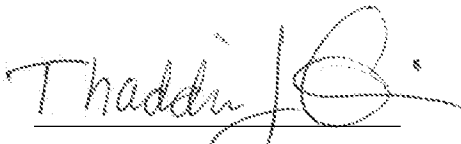
Clearly, the invention is not obvious.

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Applicant has made a significant improvement in the art of controlling air flow in ventilating pipes by providing a structure with a fastening web for air flaps that enables use in differently dimensioned ventilation pipes, and allowance of all claims is believed in order.

Applicant has endeavored to place the application in condition for allowance, and early and favorable action is believed in order and is earnestly solicited. Applicant specifically requests the opportunity to discuss this application with the examiner at an interview at the Patent Office. And, if for any reason the examiner sees need for formal changes, he is invited to call the undersigned.

Respectfully submitted,



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